

REMARKS

The description and drawing have been amended to omit reference to FIG. 1. Claims 3, 4 and 7 have been canceled, claims 1, 2, 5, 6 and 8-11 amended, and new claim 12 dependent on claim 11 added to expedite prosecution of this application without prejudice. Comments of the examiner in small, bold type precede our responses to them.

Drawings

2. Replacement drawings were received on 6/15/05. However, a new drawing in compliance with 37 CFR 1.121(d) is required in this application because the drawings fail to the requirements of 37 CFR 1.84(u)(1), as the application includes only one view. Also, the reference character of '10', mentioned on page 2 of the specification, is absent from the figure, which fails to meet the requirements of 37 CFR 1.84(p)(5). Applicant is advised to employ the services of a competent patent draftsman outside the Office, as the U.S. Patent and Trademark Office no longer prepares new drawings. The corrected drawings are required in reply to the Office action to avoid abandonment of the application. The requirement for corrected drawings will not be held in abeyance.

A new drawing is being furnished.

Claim Rejections -35 USC § 103

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3. Claims 1-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hatley et al (USPN 5113447) in view of Greenberger (USPN 5870484). "Hatley et al" will be referred to as "Hatley". Hatley discloses a system for optimizing audio imaging in an automotive listening environment. Regarding Claim 1, Hatley teaches: An audio system (200) for a vehicle (172) (col. 5, lines 35-60; Figure 2), said vehicle comprising a first passenger location (space for passengers, such as driver in Figure 2; col 5, lines 61-66) and said audio system comprising: a first directional audio channel (left channel, L, or alternatively, center channel, C) signal source (LI N input port or output of 102 for summed signal; Figures 1A and 1B; col. 3, lines 46-66; col. 4, lines 14-43); a surround audio channel signal source (side channel difference signal or ambience signal, output of 152, Figure 1B; col. 4, lines 44-63) ; a first electroacoustical transducer (168) coupled to said first directional audio signal source (L, or C, via 112' and 162; Figures 1B,2; col. 5, lines 3-13 and 43-51) and to said surround audio channel source (output of 152, via 154, 156, and summer 112'; col. 4, lines 4-1-68; col. 5, lines 1-13), situated behind said first passenger location ("rear deck", interpreted to be space adjacent to rear windshield in vehicle, such as illustrated in Greenberger, discussed below), said first electroacoustical transducer (168) constructed and arranged (connected to L ..., via amplifier 162; Figure 2) to radiate sound waves corresponding to audio signals from said first directional audio channel signal source (LI:J or output of 102) and corresponding to audio signals from said surround audio channel signal source (output of 152) (such signals are summed to form Lout_ signal and output through amplifier (162) to speaker (168);- col. 5, lines 3-13 and 43-51); and a second

electroacoustical transducer (174) coupled to said first directional audio signal source (LIN input port or output of 102, as noted above; coupled to L1 via 102,104,106,108, and 164, or alternatively, coupled to sum signal, output of 102, via 104,106,108, and 164; col. 3, lines 46-66; col. 5, lines 43-51) situated forward of said first electroacoustical transducer(168)("dashboard"; col. 5, lines 53-57), said second electroacoustical transducer constructed and arranged to radiate sound waves corresponding to audio signals from said first directional audio channel signal source (connected to C0,r, via amplifier 164; col. 5, lines 43-51; C0,,r "corresponds" to left channel source as half of signal is provided to produce center channel signal; C ,, "corresponds" to center channel source as output signal is weighed summation signal to be played back and perceived from a forward location).

Regarding the passengers in the vehicle, Hatley notes that vehicles may include a driver and one or more passengers (col. 2, lines 5-11). As noted above, Hatley teaches that-transducers (168,170) may be located in the rear deck of the automobile (col. 5, lines 47-51). However, neither seating arrangements for "or more" passengers nor the passenger-relevant location of a rear deck are clearly detailed or illustrated by Hatley.

Accordingly, Hatley does not clearly specify:

a second passenger location, said second passenger location situated behind said first passenger location, Greenberger teaches a loudspeaker array with particular radiation patterns, including several embodiments of such an invention that are applicable to an automobile (Figures 21a-e).

Specifically regarding Claim 1, Greenberger teaches:

An audio system for a vehicle (Figure 21e; col. 89, lines 41-44), said vehicle comprising a second passenger location ("rear seat", col. 90, lines 36-62; Figure 21e) said second passenger location situated behind said first passenger location ("rear seat" behind "front seat", by definition and as illustrated in Figure 21e; col. 90, lines 51-62 discuss both front and rear seat passengers).

In the context of an automobile, the "rear package shelf" of Greenberger is interpreted as equivalent to the "rear deck" of Hatley, located at least behind a front passenger location. It is further noted that Greenberger teaches the use of left and right channel speakers with front center and left and right rear speakers (col. 92, lines 7-37).

To one of ordinary skill in the art at the time the invention was made, it would have been obvious to implement the audio system of Hatley into an automobile with a rear passenger seat, as is disclosed for the automobile audio system of Greenberger. The motivation behind such a modification would have been that such an additional seating location would have provided space inside the vehicle for passengers in addition to the driver and a passenger adjacent to the driver.

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Regarding Claim 6, please refer to the above rejection of the similar limitations of Claims 1 and 3, particularly noting the movement of the audio signal along the paths between the components cited therein.

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Regarding Claim 11, please refer to the above rejection of the similar limitations of Claims 1, 3, and 5, noting the movement of the signals along the signal paths between the components cited therein.

Amended claim 1 recites an audio system that requires a particular arrangement of transducers that output a particular combination of audio channels. In particular, claim 1 specifies that the first and a second electroacoustical transducer must both be located "adjacent to a first side of the vehicle" (e.g., along a left or right side of a vehicle), with the first transducer

positioned behind a first passenger location (e.g., adjacent to the left rear passenger's seat) and the second transducer positioned in front of the first transducer (e.g., adjacent to the driver's seat). Moreover, the "first electroacoustical transducer" (e.g., a transducer located adjacent to the left rear passenger's seat) is configured to radiate "sound waves corresponding to audio signals from only (i) [a] left or right directional audio channel signal source, (ii) a center channel signal source, and (iii) [a] left or right surround audio channel signal source." (Emphasis added). Similarly, the "second electroacoustical transducer" (e.g., a transducer located adjacent to the driver's seat) is configured to radiate "sound waves corresponding to audio signals from only [the] first left or right directional audio channel signal source". (Emphasis added).

In contrast, Hatley describes a vehicle audio system that includes a transducer located along two different sides of a vehicle – one along the dashboard and a pair of transducers located along the left and right sides, respectively, of the vehicle. Figure 2 of Hatley, reproduced below, illustrates this transducer arrangement:

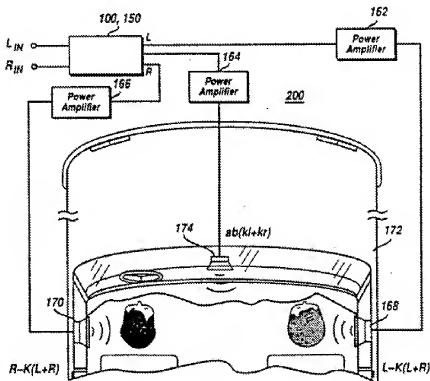


Figure 2

Not only does Hatley not describe positioning two speakers along the same side of a vehicle as in amended claim 1, Hatley also does not disclose the particular combination of signals that are supplied to the transducer of claim 1.

As shown in FIG 2 above, Hatley's dashboard transducer outputs a simulated center channel signal formed by summing some amount of the left and right channels (i.e., $2k(L+R)$). With respect to the signal supplied to the door speakers, Hatley describes two different signal combinations. In FIG. 2 above, Hatley discloses supplying an audio signal that includes the right (or left) channel with some amount of the simulated center channel subtracted out (e.g., $R-K(L+R)$). In another embodiment shown in FIG. 1B and described at col. 5 lns 15-34, Hatley discloses supplying to the door transducers a simulated "ambiance signal" (formed of a combination of either L-R or R-L) with some portion of the simulated center channel subtracted out. Thus, Hatley neither describes the particular transducer arrangement specified in amended claim 1 (i.e., a first and second transducer both located along one side of a vehicle), nor does Hatley describe the particular combination of signals that are supplied to the first and second transducers of claim 1 (i.e., a combination of only L/R, Ls/Rs, and C to the rearward speaker and only L/R to the forward transducer).

Likewise, Greenberger does not disclose the particular speaker arrangement and combination of signals that are supplied to the speakers that are recited in amended claim 1. (See, Greenberger FIGS 21a-21e, and accompanying text beginning at col. 89, ln. 41). Accordingly, Applicant respectfully submits that claim 1, along with the claims depended thereon, are patentable over Hatley, Greenberger, and the other art of record.

The remaining independent claims, i.e., 6, 11, and 12, include limitations similar to claim 1 that specify two transducers located adjacent to a side of a vehicle, with the forward transducer configured to output only a left or right channel, and the rearward transducer configured to output only a combination of (i) left or right channel, (ii) center channel, and (iii) left surround or right surround. Accordingly, all remaining claims in the application are also patentable over Hatley, Greenberger, and the other art of record.

It is believed that all of the pending claims have been addressed. However, the absence of a reply to a specific rejection, issue or comment does not signify agreement with or concession of that rejection, issue or comment. In addition, because the reasoning advanced

Applicant : Michael Fabry
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above may not be exhaustive, there may be reasons for patentability of any or all pending claims (or other claims) that have not been expressed. Finally, nothing in this paper should be construed as an intent to concede any issue with regard to any claim, except as specifically stated in this paper, and the amendment of any claim does not necessarily signify concession of unpatentability of the claim prior to its amendment.

Please apply any other charges or credits to deposit account 06-1050, Order No. 02103-399001.

Respectfully submitted,
FISH & RICHARDSON P.C.

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/charles hieken/
Charles Hieken
Reg. No. 18,411
Attorneys for Application Owner

Fish & Richardson P.C.
225 Franklin Street
Boston, MA 02110
Telephone: (617) 542-5070
Facsimile: (617) 542-8906